

IN THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

1 1-31. (Canceled)

1 32. (New) A perpendicular recording write head, comprising:
2 a first ferromagnetic pole layer having opposite proximal and distal ends, the
3 proximal end terminating at an air-bearing surface;
4 a back gap layer formed on the first ferromagnetic pole layer at the distal end;
5 a second ferromagnetic pole layer having a first end recessed from the air-bearing
6 surface and a second end coupled to the back gap layer;
7 a coil structure formed between the first and second ferromagnetic pole layers, the
8 coil structure being encapsulated by a non-magnetic material;
9 a third ferromagnetic pole layer formed on the second ferromagnetic layer having a
10 tapered tip proximate a pole tip region, the tapered tip recessed from the air-bearing
11 surface;
12 a laminated write pole tip layer formed coplanar to and adjacent the third
13 ferromagnetic pole layer for providing a flux path from the third ferromagnetic pole layer
14 to the air-bearing surface;
15 a non-magnetic material configured to completely encircle and encapsulate the
16 laminated write pole tip layer on four sides, the non-magnetic material being formed
17 between the laminated write pole tip layer and the first ferromagnetic pole layer, on a first
18 and second side of the laminated write pole tip layer and on a top side of the laminated
19 write pole tip layer;
20 a ferromagnetic write shield layer formed over the non-magnetic material disposed
21 on the top side of the laminated write pole tip layer, the ferromagnetic write shield layer
22 being physically isolated from the laminated write pole tip layer and the third write pole
23 layer; and

24 a first and a second ferromagnetic stud formed at the sides of the laminated write
25 pole tip layer, the first and a second ferromagnetic stud further connecting the first pole
26 piece and the write shield layer for providing in-line and side magnetic shields.

1 33. (New) The perpendicular recording write head of claim 32, wherein the
2 laminated write pole tip layer further comprises a trapezoidal shape to prevent adjacent
3 track writing when skew is experienced while flying over the disk.

1 34. (New) The perpendicular recording write head of claim 32, wherein the
2 laminated write pole includes a tapered portion.

1 35. (New) The perpendicular recording write head of claim 32, wherein the
2 non-magnetic material is selected from a group of materials comprising TaO_x, SiO₂, Si₃N₄,
3 Ta, W, Al₂O₃.

1 36. (New) The perpendicular recording write head of claim 32, wherein the
2 write shield layer further comprising a trailing write shield layer.

1 37. (New) A magnetic head assembly that has a head surface, a read head and
2 a perpendicular recording write head, comprising:
3 the read head including:
4 ferromagnetic first and second shield layers; and
5 a read sensor located between the first and second shield layers; and
6 the perpendicular recording write head including:
7 a first ferromagnetic pole layer having opposite proximal and distal ends,
8 the proximal end terminating at an air-bearing surface;
9 a back gap layer formed on the first ferromagnetic pole layer at the distal
10 end;
11 a second ferromagnetic pole layer having a first end recessed from the air-
12 bearing surface and a second end coupled to the back gap layer;
13 a coil structure formed between the first and second ferromagnetic pole
14 layers, the coil structure being encapsulated by a non-magnetic material;
15 a third ferromagnetic pole layer formed on the second ferromagnetic layer
16 having a tapered tip proximate a pole tip region, the tapered tip recessed from the air-
17 bearing surface;
18 a laminated write pole tip layer formed coplanar to and adjacent the third
19 ferromagnetic pole layer for providing a flux path from the third ferromagnetic pole layer
20 to the air-bearing surface;
21 a non-magnetic material configured to completely encircle and encapsulate
22 the laminated write pole tip layer on four sides, the non-magnetic material being formed
23 between the laminated write pole tip layer and the first ferromagnetic pole layer, on a first

24 and second side of the laminated write pole tip layer and on a top side of the laminated
25 write pole tip layer;
26 a ferromagnetic write shield layer formed over the non-magnetic material
27 disposed on the top side of the laminated write pole tip layer, the ferromagnetic write
28 shield layer being physically isolated from the laminated write pole tip layer and the third
29 write pole layer; and
30 a first and a second ferromagnetic stud formed at the sides of the laminated
31 write pole tip layer, the first and a second ferromagnetic stud further connecting the first
32 pole piece and the write shield layer for providing in-line and side magnetic shields.

1 38. (New) The magnetic head assembly of claim 37, wherein the laminated
2 write pole tip layer further comprises a trapezoidal shape to prevent adjacent track writing
3 when skew is experienced while flying over the disk.

1 39. (New) The magnetic head assembly of claim 37, wherein the laminated
2 write pole includes a tapered portion.

1 40. (New) The magnetic head assembly of claim 37, wherein the non-magnetic
2 material is selected from a group of materials comprising TaO_x, SiO₂, Si₃N₄, Ta, W, Al₂O₃.

1 41. (New) The magnetic head assembly of claim 37, wherein the write shield
2 layer further comprising a trailing write shield layer.